ATOMIC ENERGY newsletter

THE FIRST AND ONLY

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Dear Sir:

Whether the United States should build the hydrogen bomb is now the biggest, and most controversial single subject being debated in high government councils in Washington. Such a bomb (which would utilize the energy produced during the fusion of two atoms of the heavy form of hydrogen in forming an isotope of helium), could be designed to be between 30 to 40 times more destructive than the present atomic (fission) bomb. However, limitations of our present stage of nuclear technology would hold it to no more than 2 to 10 times such explosive power. The question of building this H-bomb, and whether another effort to reach international control of atomic energy be made before it is built, or after, is being examined from all angles by the AEC, the State Department, the Joint Chiefs of Staff at the Department of Defense, and a coordinating group representing all three plus the White House. Last week, President Truman said that he, and no one else, will make the decision on constructing the H-bomb. Meanwhile, Dr. Harold C. Urey, pioneer physicist worker on the original atomic (fission) bomb, declared in New York last week that unless the H-bomb is built, the U. S. will lose the armaments race. Bernard Baruch has advocated its construction as a matter of self defense. Cost of putting the U. S. into the hydrogen bomb business is estimated at between $500 million and $1 billion. Problems to be solved are largely in the field of technology and engineering, rather than in pure science. However, investigations now underway at Los Alamos (page 2, this LETTER), and other centers, have been directed toward energy producing reactions typical of that of the H-bomb.

Possible changes in the atomic energy "Declassification Guides" (joint codes of secrecy covering atomic work), will be discussed by AEC representatives from the United States, and representatives from Great Britain and Canada, who will meet in Harwell, England, from February 9th through 12th. It will be the fourth such meeting. The first was held in Washington, November, 1947; the second at Harwell, in 1948; and the third at Chalk River, Canada, last September. Those favoring a revision of the guides state that too much basic secrecy slows the progress of United States atomic research, as well as that of friendly powers.

Studies in nuclear fission, the facilities by which nuclear fission is obtained, and the use of the products thereof will be studied at Massachusetts Institute of Technology under a $250,000.00 grant-in-aid recently made by the Cities Service Research and Development Co., of New York. The grant is payable at the rate of $50,000.00 a year.

The use of radiocalcium to study the distribution of calcium between molten slags and iron saturated with carbon will be described at the 1950 annual meeting of the American Institute of Mining and Metallurgical Engineers, being held in New York February 12-16. W. O. Philbrook, K. M. Goldman, and H. M. Helzel, of Carnegie Institute of Technology, will address the A. I. M. E. meeting on this subject.

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AT THE ATOMIC CITIES AND CENTERS IN THE UNITED STATES...

OAK RIDGE, Tennessee- Private utility companies have been asked by the AEC to submit proposals for constructing and operating a natural gas utility here. Preliminary letters on the subject were sent out last week by the AEC to utility companies and others who have shown interest in supplying Oak Ridge's residents, and current and future commercial users in Oak Ridge, with natural gas. "Every effort is being made (the letter stated), to encourage private enterprise, and we are looking forward to possible eventual incorporation of the town, and the sale of houses and commercial buildings to private owners." Information and statistical data on estimated gas supplies available, and the community's estimated requirements, are now being made available to the gas utilities industry generally. The proposals that have been asked, however, are essentially exploratory. There is now no approved AEC program to utilize such a system, and no funds have been set aside for converting existing coal burning facilities to gas. Further steps by the AEC will depend on whether any attractive proposals are received. Now, since the recent completion of the high-pressure pipeline here (AEN 1/17/50, p. 3), natural gas is supplying industrial atomic energy facilities at Oak Ridge...To construct a combined shop and office building (no. 706-HD) at the National Laboratories here, invitation no. 401-50-6A has now been issued by the AEC here. Bids will be received until February 15th for the 2400 square foot building...In another invitation (no. 401-50-5A), contractors were asked to bid on construction of 50 single family dwellings. Divided into two projects, an alternate bid for one project may be the Lustron Corporation model 03 prefabricated dwelling unit, modified as in the specifications.

LOS ALAMOS, Mew Mexico- The Soviet Union can outproduce the U. S. in atomic bombs, Dr. Edward Teller recently declared here, in citing the need for a world government as a moral deterrent to war. Dr. Teller is head of the weapons division of the Los Alamos Scientific Laboratories. He noted the ability of the USSR to produce an atomic bomb in four years (approximately the same length of time the U.S. required), and the accelerated Soviet atomic weapons program.

Among research data assembled at the Scientific Laboratories here are the results of investigations into the energy-producing reactions of the light elements. In the event the U. S. undertakes large-scale production of the hydrogen bomb, the work will be of importance in its construction. (See p. 1, this LETTER.)

ARCO, Idaho- Engineering and process design work now being done by Blaw-Knox Construction Co. on the Materials Testing Reactor (AEN 12/6/49, p. 2), one of the four nuclear reactors to be erected at the nuclear reactor testing station here, is expected to be completed late in 1950. However, contractors for both fee and fixed-price work will be selected this Winter, and active construction of the project will be started as soon as the weather breaks this Spring, before completion of the detailed plans.

As to general progress here: At the Experimental Breeder Reactor, field work has been completed and contracts awarded for the furnishing and erecting of steel; this work has all been on a competitive fixed-price basis. Surveys and explorations have been completed for the Materials Testing Reactor, and sites are being studied for the Ship Propulsion Reactor (AEN 1/3/50, p. 2), and the chemical separation plant (AEN 12/20/49, p. 2) which will do nuclear fuel recovery and decontamination.

RICHLAND, Washington- Graduating engineers and natural scientists at U.S. universities and colleges are now being recruited by General Electric Co. (operators of Hanford Plutonium Works) for an industrial training program at Hanford of 9 to 18 months duration. The new graduates will be assigned progressively to at least three of the Hanford plants and laboratories. The training will be patterned after similar industrial training programs operated by G-E and other industrial companies.

BROOKHAVEN NATIONAL LABORATORY, Upton, New York- New Chairman of the Accelerator Project here will be Dr. George B. Collins, now Chairman of the Physics Department of the University of Rochester. Dr. Collins, who will take over this Spring, will have charge of all the accelerators now being designed and built at (or for) Brookhaven.

PRODUCTS, PROCESSES, & INSTRUMENTS... for nuclear work...

An airborne detector for radioactive minerals was test flown in the Canadian north last summer, according to Dr. George Shaw, of the Geological Survey, of Canada. In flights over known deposits, the instrument proved its ability to pick up radioactive zones; further work on the instrument is planned. Development of the airborne detector was a joint project of the National Research Council (Atomic Energy Division), the Bureau of Mines, and the Geological Survey, all of which are interested Canadian agencies.

The Radiation Instruments Branch of the AEC has moved from Oak Ridge, Tenn., to Washington, D. C., where it is now housed at the National Bureau of Standards. The Branch acts as liaison between the AEC and private concerns on instrumentation matters, and works closely with the American radiation instruments industry, which has grown, in the past three years, from approximately ten companies to over 60 companies, doing an annual business of $4 million. Mail for the Radiation Instruments Branch should be sent to 1901 Constitution Ave., while bulk shipments should be addressed to it at the National Bureau of Standards, Connecticut & Van Ness St., Washington, D. C.

St. John X-ray Laboratory, Califon, N.J., is now prepared to use cobalt-60 for industrial radiography. The laboratory, which has announced receipt of a 350 mc source of the isotope, has designated a separate building for the exclusive use of the cobalt-60, and is also ready to apply it on any field job. (See AEN 6/21/49: "Nuclear Development Associates, of New York, recommend cobalt-60 for non-destructive testing".)

A small quantity of Geiger-Muller tubes, AEC #BG-1A12A or equal, will be bought by the Contracting Officer, Chemical Corps Procurement Agency, Army Chemical Center, Md., under requisition no. 3674. Proposals by interested suppliers must be submitted by Feb. 6th, 1950.

FROM THE MANUFACTURERS- Type 52-N thin wall metal radiation counter tube for beta and gamma radiation; self quenching. Said to have an unlimited life, and will not be harmed by accidental overvoltage.--Amperex Electronic Corp., 25 Washington St., Brooklyn, N. Y.

Radioactivity demonstrator, Keleket model K-900. For classroom and lecture demonstration. Includes flashing neon bulb, adjustable volume loudspeaker, and meter calibrated in counts per minute.--Kelley-Koett Manufacturing Co., Covington, Ky.

ATOMIC PATENT DIGEST...latest U. S. & British applications & grants...

Voltage doubling circuits. U. S. Pat. No. 2,493,137, issued Jan. 3rd, 1950, to W. W. Hansen, and assigned to United States of America (USAEC).

Method of logging a borehole. Comprises, (1) detecting variations in the natural gamma radioactivity of the formations surrounding the hole, (2) continuously measuring direct radiation from a radioactive source passed through the hole, and (3) noting variations in the radioactivity from the source caused by changes in a characteristic of the hole. U. S. Pat. No. 2,493,346, issued Jan. 3rd, 1950, to G. Herzog, and assigned to The Texas Company.

High energy neutron counter. Consists of several parallel spaced electrodes, separated by an ionizable atmosphere. These electrodes are transparent to high energy neutrons, and at least one of them is coated with a thin layer of bismuth having a thickness of the order of one milligram per square cm. A means is provided to impress a potential between adjacent electrodes. U. S. Pat. No. 2,493,935, issued Jan. 10th, 1950, to C. E. Wiegand, and E. Segre, and assigned to United States of America (USAEC).

Mounted specimen, for microscopic examination. Utilizes reinforcing blanks, and a moulded block of plastic. The plastic block, which incases the specimen and blanks, has one surface finished to expose a transverse section of the specimen for microscopic examination. U. S. Pat. No. 2,494,834, issued Jan. 17th, 1950, to R. S. Ringheim, and assigned to United States of America (USAEC).

RADIOISOTOPES...latest tracer applications...

For measuring horizontal mixing in various water and sewage processes, the use of radioactive isotopes has several advantages over the previous methods of using salts and dyes, H. A. Thomas, and R. S. Archibald told the American Society of Civil Engineers in New York last week. They discussed tests conducted at Harvard University. The foremost advantage of the radioisotopes, they said, is that they can be detected in extremely small concentrations. Such low concentrations do not cause observable density currents which may disturb flow patterns. Passage of tracer clouds can be detected through conduit walls, eliminating the need for sampling the flow. Further, no chemical or biological reactions occuring in the flow interfere with the rate of disintegration of the isotope: temperature changes have no effect; and the absorption of the tracer on solid surfaces can be made negligible by proper choice of isotope. As to disadvantages in using radioisotopes, Thomas and Archibald mentioned the care required to protect laboratory people from over exposure to radiation, and the cost, which although usually reasonable, runs high when energy is dissipated during long shipping delays.

Investigations into photosynthesis, using radioisotopes, are now underway at 15 institutions in the U.S. which are using isotopes on this one problem alone, Dr. P. C. Aebersold, of the AEC, told the Southern Association of Science and Industry in New Orleans recently. Most of the studies, he said, are being made on simple algae plants grown in an atmosphere containing amounts of radioactive carbon dioxide. The laboratory technique is to isolate and identify the radioactive intermediate products at invervals during the photosynthesis process. One laboratory has identified five compounds formed within five seconds after photosynthesis started, and it has also been discovered that within ninety seconds at least fifteen compounds containing radiocarbon are produced.

As a result of work done in applying radioisotopes to metallurgical problems at the Metals Research Laboratory, Carnegie Institute of Technology, Pittsburgh, L. E. Birchenall, and W. O. Philbrook, of that laboratory, have suggested applications for radioisotopes in metallurgy. Measurement of self-diffusion coefficients; determining diffusion coefficients for one metal in dilute solution in another; and studies of oxidation and scaling, are some applications in the process field and metallurgy. Difficulties cited include extraneous counts from radioactive impurities; uncertainties in interpreting counting data because of the complex decay pattern of the isotope used, or because it has not been adequately reported in the literature; and lack of resolution of photographic techniques for fine details of structure.

IONIZING RADIATION...investigations & notes...

Radioactive phosphorous (phosphorous-32) has been used by Hymer L. Friedell, and John P. Storaals, Department of Radiology, University Hospitals, and Western Reserve University School of Medicine, Cleveland, Ohio, in 10 cases of primary polycythemia, and 15 cases of chronic myeloid leukemia. In the primary polycythemia, 8 cases responded favorably. The duration of remissions in these 8 cases ranged from 4 to 15 months; the average remission period was approximately 7 months. Of the 13 cases of chronic myeloid leukemia responding favorably, immediate and excellent response was obtained in the white blood cell count, and associated with this a rise in the red blood cell count was noted in most cases. The investigators suggest that, since it is not possible to eradicate the disease with phosphorous-32, that its use be limited, with as small amounts used of the isotope as possible. (See AEN 11/8/49, p. 4: Phosphorous-32 therapy.)

Declaring himself "neither optimistic nor enthusiastic about the ability of the betatron to solve the cancer problem", Dr. Roger A. Harvey, Chairman of the Department of Radiology, College of Medicine, University of Illinois, has recently written to the American Medical Association decrying the newspaper publicity on the College's medical betatron. In the betatron's present state, according to Dr. Harvey, it may be helpful for about 10% of patients with cancer. It is not suitable, he noted, for widespread cancer, terminal situations, or cancers of a radiation-resistant type.

PEOPLE...in the atomic energy industry...

Dr. V. Lawrence Parsegian has been appointed Director of the Division of Technical Advisers of the New York Operations Office of the AEC. He will administer basic research, and contracts in the physical sciences with more than fifty academic and industrial research institutions.

Dr. Paul B. Pearson is the new Chief of the Biology Branch of the Division of Biology & Medicine, AEC. He will supervise the biology research program of the AEC, which includes work in the bio-chemical, genetics, and physiological fields at AEC installations, and AEC-supported research projects at colleges and universities.

Dr. Paul J. Larsen, formerly Director of the Sandia Laboratories (atomic bomb engineering center), was named last week as Chairman of the Civilian Mobilization Office, of the National Security Resources Board, the government agency charged with planning for wartime civil defense. Dr. Larsen, who will take office March 1st, will supervise planning for civil defense, health resources, housing and community services, as well as strategic dispersion of industrial and governmental facilities.

RAW MATERIALS...radioactive ores & other essentials for nuclear work...

UNITED STATES- Reports from Marysvale, Utah, where uranium ore find of Pratt Seegmiller (AEN 10/25/49. p. 5) is now being worked by Vanadium Corporation of America, are that the entire zone carries about 0.25% uranium oxide. Other reports on the find, which is in autunite, place the return at 0.36% to 0.76% uranium oxide. (This compares with the 0.1% to 0.2% uranium oxide content of carnotite, the mineral in which most finds have been made in the U. S.) Claims in the vicinity of the Seegmiller lease totaling 200 acres have been leased by VCA...The State Conservation Commission of Michigan has approved leasing uranium mining rights on eighty acres of state land to the Jones & Laughlin Ore Company. The land is around the Negaunee uranium mineral find of J & L (AEN 1/3/50, p. 5), in northeast Baraga County, Michigan, along the Huron River, near Lake Superior.

CZECHOSLOVAKIA- New mines in the Bohutice area of Bohemia are reported to be yielding uranium ore of a higher quality than that obtained at the Jachymov (Joachimsthal) pitchblende mines in the Erzgebirge region here. The Bohutice output, estimated at 400-500 tons a month, is being forwarded to the Soviet Union, as are the Jachymov ores. Confirmation was recently given by Premier Zapotocky, of Czechoslovakia, that the USSR uses the Jachymov output (AEN 11/22/49, p. 3).

BOOKS & OTHER PUBLICATIONS... in the nuclear field...

Atomic Energy Year Book. Edited by John Tutin. While broad in scope, the year's work is not dealt with as comprehensively as the title "Year Book" might indicate. Published in England last Fall; now issued in the U. S. 254 pages.-- Prentice-Hall Inc., New York 11, N. Y. ($5.85)

Five reports of the Nuclear Science Series available without charge from the National Research Council, 2101 Constitution Ave., Washington 25, D. C., on request from active workers in nuclear science: (1) Nuclear Electric Quadrupole Moments & Quadrupole Couplings in Molecules, by B. I. Feld; (2) Energy Levels of Light Nuclei, by T. Lauritsen; (3) Neutrons from Alpha Emitters, by H. L. Anderson; (4) Monoenergetic Neutrons from Charged Particle Reactions, by A. O. Hansen, and R. F. Taschek; (5) Photoneutron Sources, by A. Wattenberg.

Atomic Medical Cases. A motion picture, photographed originally in 1945 by the Japanese in the areas of Hiroshima and Nagasaki following the atomic bomb explosion. Condensed version released in 1949 by the U. S. Army. Procurable on loan from the Surgeon General of the Army area in which the request originates. No. PMF-5142, 16mm., black & white sound, 37 minutes.

Sincerely,

The Staff,
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